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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/519,760

10/28/2005

Robert Polfreman

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BRINKS HOFER GILSON & LIONE
P.O. BOX 10395
CHICAGO, IL 60610

EXAMINER

ENSEY, BRIAN

ART UNIT

PAPER NUMBER

2615

MAIL DATE

DELIVERY MODE

05/02/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/519,760	Applicant(s) POLFREMAN ET AL.	
	Examiner Brian Ensey	Art Unit 2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/5/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I, claims 1-37 in the reply filed on 3/11/08 is acknowledged.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The information disclosure statement filed 5/5/05, line item A2 has not been considered since it is the wrong document number for the listed inventor. A corrected document number should be submitted for consideration. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

Specification

The abstract of the disclosure does not commence on a separate sheet in accordance with 37 CFR 1.52(b)(4). A new abstract of the disclosure is required and must be presented on a separate sheet, apart from any other text.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The disclosure is objected to because of the following informalities: The applicant should be consistent in naming element 120: See paragraph 063, line 6, "cylindrical region 120 of the diaphragm 120".

Appropriate correction is required.

Drawings

Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "120" and "122" have both been used to designate the conical region (See Figs. 6 and 9). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing

date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "120" and "122" have both been used to designate the cylindrical region (See Figs. 6 and 9). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claim 16 is objected to because of the following informalities: Claim 16 depends from itself. For the purpose of examination the examiner will consider claim 16 as depending from independent claim 15. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 5, 10-14, 15-21 and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The aforementioned claims are directed to a first region and a second region and coatings formed thereon. The specific configuration and location of these regions is unclear with respect to the current claim language and where the coatings are actually formed. For the purpose of further examination the examiner will utilize the included drawings to best determine the relative region locations.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 7-9 and 26-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Persson GB 369,992.

Regarding claim 1, Persson discloses a loudspeaker diaphragm having an acoustic region, the loudspeaker diaphragm comprising: a first region (outer edge) having an inner and outer surface, a second region (center) radially inward of the first region and having an inner and outer surface, a coating (f) formed on at least one surface of the first and second regions; where the coating tapers from a maximum value in the first region to minimum value in the second region (See Fig. 4 and lines 88-95).

Regarding claim 2, Persson further discloses the coating comprises a continuous layer (See lines 90-92).

Regarding claim 7, Persson further discloses the first region is substantially conical (See Fig. 4, curve of diaphragm).

Regarding claim 8, Persson further discloses the second region is substantially cylindrical (See Fig. 4, opening at center of diaphragm).

Regarding claim 9, Persson further discloses the first region comprises at least a portion of the acoustic region of the diaphragm (See Fig. 4).

Regarding claim 26, Persson discloses a loudspeaker diaphragm comprising: a conical portion (Fig. 4, curve of the diaphragm), a cylindrical portion (Fig. 4, center edge of the diaphragm), and a coating formed (f) on at least one major surface of at least the conical and cylindrical portions, where the coating tapers from a maximum value on the conical portion to a minimum value on the cylindrical portion (See Fig. 4 and lines 88-95).

Regarding claim 27, Persson further discloses the coating is continuous (See Fig. 4, coating is continuous from the outer edge to the inner edge).

Regarding claim 28, Persson further discloses the coating tapers from a maximum value at the periphery of the conical region to a minimum value in the cylindrical region (See Fig. 4).

Claims 34 and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Hawley et al. U.S. Patent No. 1,715,598.

Regarding claim 34, Hawley discloses a loudspeaker diaphragm (1) comprising: an inner surface (5), an outer surface (4), and a continuous coating (4, 5, See lines 75-94) applied to each of the inner and outer surfaces, where the coating on the inner surface is tapered (See Fig. 2).

Regarding claim 35, Hawley further discloses the coating on the outer surface is tapered (See Fig. 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-6, 13, 14 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Persson as applied to claims 1 and 26 above, and further in view of Ugaji et al. U.S. Patent No. 4,726,443

Regarding claims 3 and 4, Persson does not expressly disclose the diaphragm is at least partially formed of aluminum, titanium, magnesium, an alloy of aluminum, titanium, magnesium, or combinations thereof and the coating is formed of a carbide, boride, nitride, or oxide. However, the use of metal diaphragms with oxide coatings is well known in the art and Ugaji teaches a diaphragm made of aluminum with an anodic oxide film (See Fig. 1 and col. 3, lines 45-50). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a tapered diaphragm as taught by Persson with the metal substrate and oxide coating of Ugaji to provide increased bending rigidity and prevent the occurrence of peaks at high frequencies (See Ugaji col. 3, lines 4-8).

Regarding claim 5, Persson discloses a diaphragm as claimed. Persson does not expressly disclose the coating has a thickness of from about 0.1 microns to about 8 microns in the second

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region and a thickness from about 2 microns to about 100 microns in the first region. However, Persson teaches the coating is tapered from the first region to the second region. Ugaji teaches the coating thickness of about 6 microns (See col. 6, lines 31-34) and multiple applications result in a coating thickness of 23 microns (See col. 7, lines 1-3). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention that the tapered thickness of the coating depends on the time and number of applications as taught by Ugaji.

Regarding claims 6 and 31, Persson discloses a diaphragm as claimed. Persson does not expressly disclose the coating is an anodically formed oxide layer. However, application of an anodically formed oxide layer is well known in the art and Ugaji teaches an anodically formed oxide layer (See abstract). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to anodically apply the coating to the diaphragm as taught by Ugaji a secure coating to the base metal.

Regarding claims 13 and 14, Persson discloses at least portions of the inner surfaces of the first region and second region are coated (See Fig. 4). Persson does not expressly disclose at least portions of the outer surfaces of the first region and second region are coated. However, coating the entire region of both the inner and outer surfaces of a diaphragm are well known in the art and Ugaji teaches coating both the inner and outer surfaces of the entire diaphragm (See Fig. 1 and col. 3, lines 6-25). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to coat both sides of the entire diaphragm of Persson as taught by Ugaji to provide increased bending rigidity and prevent the occurrence of peaks at high frequencies (See Ugaji col. 3, lines 4-8).

Claims 10- 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Persson as applied to claim 1 above, and further in view of Hawley et. al. U.S. Patent No. 1,715,598.

Regarding claims 10 -12, Persson discloses a diaphragm as claimed. Persson does not expressly disclose the coating in the first region comprises a first area of substantially uniform thickness and a second area of non-uniform thickness, the second area of the first region is tapered and the first area is radially outward of the second area. However, varying the thickness of a diaphragm at specific regions is well known in the art and Hawley teaches the coating on the diaphragm in such thicknesses and variations of thicknesses at any given point or points in the diaphragm to produce resonances of different periods and to localize nodal points at desired places (See Hawley lines 12-33). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to make minor changes in shape and form while providing similar functions (In re Dailey, 149 USPQ 47 (CCPA 1976)).

Claims 15 - 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rouy U.S. Patent No. 3,215,647 in view of Hawley et al.

Regarding claim 15, Rouy discloses a loudspeaker diaphragm (24) comprising: a first region (outer edge at 26), a second region (inner edge at center), a transition region (peak at thickest region) between the first region and the second region, and a continuous coating (metallic skin) formed on at least one major surface of the first region, the second region, and the transition region (See Figs. 1 and 4 and col. 2, lines 52-59). Rouy does not expressly disclose the coating in at least the transition region is tapered. However, the use of varying thicknesses of coatings is well known in the art and Hawley teaches a coating tapered at transition region 6 (See Fig. 2). Therefore, It would have been obvious to one of ordinary skill in the art at the time of

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the invention to make minor changes in shape and form while providing similar functions (In re Dailey, 149 USPQ 47 (CCPA 1976)).

Regarding claims 16-21, the combination of Rouy in view of Hawley further discloses at least a portion of the coating in the first region is tapered (See Hawley 4, Fig. 2), the coating in the second region is of substantially uniform thickness (See Hawley 2, Fig. 1), the coating in the second region is tapered (See Hawley 5, Fig. 2), the coating tapers from a maximum value in the first region to a minimum value in the second region (See Hawley Fig. 2, tapers from max. at center of 5 to min. at edge on 4), one portion of the coating in the first region is tapered (See Hawley Fig. 2, 5 tapered from 6 to edge) and another portion of the coating is of substantially uniform thickness (See Hawley Fig. 2, 5 uniform at edge) and the portion of the coating of substantially uniform thickness is radially outward of the tapered portion (See Hawley Fig. 2, 5 uniform at edge).

Claims 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Rouy in view of Hawley as applied to claim 15 above, and further in view of Ugaji.

Regarding claims 22 and 23, the combination of Rouy in view of Hawley does not expressly disclose the diaphragm is at least partially formed of aluminum, titanium, magnesium, an alloy of aluminum, titanium, magnesium, or combinations thereof and the coating is formed of a carbide, boride, nitride, or oxide. However, the use of metal diaphragms with oxide coatings is well known in the art and Ugaji teaches a diaphragm made of aluminum with an anodic oxide film (See Fig. 1 and col. 3, lines 45-50). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a tapered diaphragm as taught by

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the combination of Rouy in view of Hawley with the metal substrate and oxide coating of Ugaji to provide increased bending rigidity and prevent the occurrence of peaks at high frequencies (See Ugaji col. 3, lines 4-8).

Regarding claim 24, the combination of Rouy in view of Hawley discloses a diaphragm as claimed. The combination of Rouy in view of Hawley does not expressly disclose the coating has a thickness of from about 0.1 microns to about 8 microns in the second region and a thickness from about 2 microns to about 100 microns in the first region. However, the combination of Rouy in view of Hawley teaches the coating is tapered from the first region to the second region. Ugaji teaches the coating thickness of about 6 microns (See col. 6, lines 31-34) and multiple applications result in a coating thickness of 23 microns (See col. 7, lines 1-3). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention that the tapered thickness of the coating depends on the time and number of applications as taught by Ugaji.

Regarding claim 25, the combination of Rouy in view of Hawley discloses a diaphragm as claimed. The combination of Rouy in view of Hawley does not expressly disclose the coating is an anodically formed oxide layer. However, application of an anodically formed oxide layer is well known in the art and Ugaji teaches an anodically formed oxide layer (See abstract). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to anodically apply the coating to the diaphragm as taught by Ugaji a secure coating to the base metal.

Claims 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Persson.

Regarding claims 29 and 30, Persson discloses a diaphragm as claimed. Persson does not expressly disclose the thickness of the coating in the cylindrical region is uniform and the thickness of the coating in an area of the conical region adjacent the periphery of the conical region is uniform. However, Persson teaches the cone ends in a conical region (center of the diaphragm) and the coating taper to the end where the conical portion is formed. Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention that the coating at the conical region is necessarily uniform.

Claims 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Persson as applied to claim 26 above, and further in view of Devantier et al. U.S. Patent No. 6,327,372.

Regarding claim 32, Persson discloses a diaphragm as claimed. Persson does not expressly disclose a dome attached to a surface of the coating on the conical region. However, the use of domes on speaker diaphragms is well known in the art and Devantier teaches a dome (14) attached the coated diaphragm to protect the speaker apparatus form dust and coats the dome with an anodized layer for moisture and humidity protection (See Devantier Fig. 1 and col. 1, lines 35-64). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the diaphragm of Persson with the dome of Devantier to provide dust protection to the speaker and to coat the dome to provide moisture and humidity protection.

Regarding claim 33, the combination of Persson in view of Devantier discloses a diaphragm and dome as claimed. The combination of Persson in view of Devantier does not expressly disclose the coating on conical region outside the dome is of uniform thickness and the coating on the conical region inward of the dome is tapered. However, varying the coating thickness is well known in the art and It would have been obvious to one of ordinary skill in the

art at the time of the invention to make minor changes in shape and form while providing similar functions (In re Dailey, 149 USPQ 47 (CCPA 1976)).

Claims 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hawley.

Regarding claims 36 and 37, Hawley discloses the coating on the inner and outer surfaces is uniform (See Fig. 1). Hawley does not expressly disclose the coating on the outer surface is uniform and thinner than the coating on the inner surface when the coating on the inner surface is tapered. However, It would have been obvious to one of ordinary skill in the art at the time of the invention to make minor changes in shape and form while providing similar functions (In re Dailey, 149 USPQ 47 (CCPA 1976)).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Ensey whose telephone number is 571-272-7496. The examiner can normally be reached on Monday - Friday 6:00 AM - 2:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any response to this action should be mailed to:

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/Brian Ensey/
Primary Examiner, Art Unit 2615
April 28, 2008